

Examiner Reddick is thanked for the interview granted Applicants' representative on November 14, 2002. The amendment represents the results of that interview. An additional amendment is also submitted, as discussed below.

The specification at page 6, in the paragraph starting at line 36, is amended to include as a polymeric dispersant a 1:1 molar ratio copolymer of N-vinylcaprolactam and N-vinylmethylacetamide. Claims 1, 5 and 7 are similarly amended. Basis for this amendment appears in Example 5 of the specification, appearing on page 11, where the recited copolymer together with polyethylene glycol is employed as a dispersant.

The remaining amendments are those discussed at the noted interview.

Claims 1 and 5 are amended to include the recitation "the aqueous dispersion being substantially free of stabilizing inorganic salts," referring to the dispersion appearing in the introductory phrase of the claim. Basis for the recitation appears at page 2 of the specification, line 4, and at page 4, line 15.

Claim 5 is amended to replace the generic term "polymers" with the singular term "a polymer" and the dispersion is referred to as "an aqueous dispersion".

In the paragraph labeled "A", the recitation "if desired together", criticized in the Official Action, is replaced with the phrase "with or without" and the introductory recitation "monomers comprising" is included.

The final amendment to the claim appears at the end of the claim where it is recited that "the ratio of components (A) and (B) being so selected that the polymerization results in dispersions of 50 nm to 2  $\mu$ m sized particles of the water-soluble polymer in water". This represents a desired result of the polymerization procedure, as set forth in product Claim 1.

The improper dependency of Claim 8 is remedied by amending Claim 8 to be singly dependent from Claim 5 and adding new Claims 9 and 10 to recite the dependency from Claims 6 and 7, respectively.

#### THE CLAIM REJECTIONS

The rejection of Claims 5-8 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out distinctly claimed subject matter which Applicant regards as the invention, is requested to be withdrawn in view of the amendment to the claim. The criticized recitation regarding the recited relative proportions is overcome by the amendment discussed at the interview.

"Azocompounds" is replaced by "an azo compound", using the conventional singular rather than the generic plural. "Dispersant" replaces "dispersants". This overcomes the improper antecedent basis criticism. In Claim 5, "initiator" replaces "initiators".

Reconsideration and withdrawal of Claims 1-7 under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Fong et al (U.S. 6,426,383) are requested.

After describing their invention broadly as being to a process for the production of water-soluble polymer dispersion from vinylamide monomers, Fong et al disclose that the result is obtained by them by carrying out the polymerization in an aqueous salt solution, column 3, lines 24 and 25. The amount of salt used is "from about 5 to about 40 wt% based on the weight of the dispersion" column 4, lines 23-27. The above is repeated several times in the subsequent specification, as at column 5, the paragraph at line 42. The preferred concentrations are 15% or more, preferably 20% or more, column 14, lines 54 and 55.

In Example 1, calculations indicates that 38% salt was employed. In Example 2, 25% salt was employed. Examples 3 and 4 relate to the hydrolysis of the product.

Claim 1 contains the "from about 5 to about 40 wt% based on the total weight on the dispersion" recitation.

It is therefore quite clear that Fong et al require the presence of a sufficient amount of stabilizing salt in order to achieve their purpose.

Applicants' achievement is to develop a procedure which leads to a product which does not contain the stabilizing salt and the large amounts required for stabilization. As Applicants point out, at page 4, lines 18 and 19, the known dispersions have a very high salt load, which is obviously basically undesirable.

The subject claims are therefore not anticipated by Fong et al, and indeed are not obvious over Fong et al because Fong et al make it very clear that they consider the salt and in stabilizing amounts to be required and indeed point out that the prior art has considered aqueous salts as required for dispersion in water of water soluble polymers, column 1, the paragraph at line 42.

This is indeed confirmed by the cited Matsushima patent, U.S. 5,936,042. In Preparation Example 3 of that patent, N-vinylformamide is polymerized in water without such salt and what is obtained is a viscous solution of a polymer (please see the example at column 8, line 20).

It follows that Applicants' procedure and product are not obvious over Fong et al.

Reconsideration and withdraw of the rejection of Claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Fong et al (U.S. 6,426,383) in combination with Matsushima et al (U.S. 5,936,042) are requested.

The rejection is based upon the fact that the Matsushima et al reference discloses the dispersants recited in that claim as well as polyvinyl alcohol employed by Fong et al.

However, Matsushima et al do not practice their invention in the presence of significant amounts of water in water-soluble salt, that is stabilizing amounts of such salt. Hence, the equivalence of these water-soluble polymers for the purpose of Matsushima et al does not establish their equivalence for the purpose of Fong et al. Please note that in the Preparation Examples 1 and 2, water insoluble polymers are obtained since acrylonitrile is used as a comonomer. In Preparation Example 3, where the monomer polymerized is N-vinylformamide alone, a water solution is obtained of the polymer.


In any event, the subordinate Matsushima et al document does not supply the essential feature of Applicants' disclosure, namely, achieving a product which is free of a loading of salt.

New Claims 9 and 10 raise no new issues.

For the reasons above, favorable reconsideration is solicited.

Respectfully submitted,

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Amendment Filed Herewith

IN THE SPECIFICATION

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Please replace the paragraph starting at page 6, line 36 and ending at page 6, line 43, with the following:

are polymerized at from 40 to 55°C with water-soluble [azoinitiators] azo initiators. Suitable polymeric dispersants (B) are preferably polyethylene glycol, polypropylene glycol, copolymers of ethylene glycol and propylene glycol, polyvinyl acetate, polyvinyl alcohol, polyvinylpyridine, polyvinylimidazole, polyvinylsuccinimide, a 1:1 molar ratio copolymer of N-vinylcaprolactam and N-vinylmethylacetamide, polydiallyldimethylammonium chloride, polyethyleneimine and mixtures thereof. The molar masses of these polymers are preferably from 1500 to 50,000.

IN THE CLAIMS

--1. (Amended) An aqueous dispersion of a water-soluble polymer of N-vinylformamide and/or of N-vinylacetamide, wherein the dispersion contains, based on 100 parts by weight of water,

(A) from 5 to 80 parts by weight of a water-soluble polymer containing N-vinylformamide units and/or N-vinylacetamide units and having a particle size of from 50 nm to 2  $\mu$ m

(B) from 1 to 50 parts by weight of at least one polymeric dispersant which is selected from the group consisting of carboxymethylcellulose, water-soluble starch, starch esters, starch xanthogenates, starch acetates, dextran, polyalkylene glycols, polyvinyl acetate, polyvinyl alcohol, polyvinylpyrrolidone, polyvinylpyridine, polyethyleneimine, polyvinylimidazole, polyvinylsuccinimide, a 1:1 molar ratio copolymer of N-vinylcaprolactam and N-vinylacetamide, and polydiallyldimethylammonium chloride, the aqueous dispersion being substantially free of stabilizing inorganic salt.

5. (Amended) A process for the preparation of an aqueous [dispersions] dispersion of a water-soluble polymer [polymers] of N-vinylformamide and/or of N-vinylacetamide, wherein

(A) from 5 to 80 parts by weight of monomers comprising N-vinylformamide and/or N-vinylacetamide, [if desired together] with or without other monoethylenically unsaturated monomers, which form water-soluble polymers therewith, and

(B) from 1 to 50 parts by weight of at least one polymeric dispersant which is selected from the group [comprising] consisting of carboxymethylcellulose, water-soluble starch, starch esters, starch xanthogenates, starch acetates, dextran, polyalkylene glycols, polyvinyl acetate, polyvinyl alcohol, polyvinylpyrrolidone, polyvinylpyridine, polyethyleneimine, polyvinylimidazole, polyvinylsuccinimide, a 1:1 molar ratio copolymer of N-vinylcaprolactam and N-vinylmethylacetamide, and polydiallyldimethylammonium chloride, in 100 parts by weight of water substantially free of stabilizing inorganic salts, are subjected to free radical polymerization at from 30 to 95°C in the presence of from 0.001 to 5.0% by weight, based on the monomers used, of a polymerization [initiators] initiator which [form]

forms free radicals under the polymerization condition, the ratio of the components (A) and (B) being so selected that the polymerization results in dispersions at 50 nm to 2  $\mu$ m sized particles of the water soluble polymer in water.

6. (Amended) A process as claimed in claim 5, wherein

(A) from 10 to 50 parts by weight of monomers comprising N-vinylformamide and/or vinylacetamide, [if desired together] with or without other monoethylenically unsaturated monomers which form water-soluble polymers therewith, and

(B) from 5 to 40 parts by weight of at least one polymeric dispersant, in 100 parts by weight of water, are polymerized at from 40 to 70°C with from 0.5 to 2.0% by weight, based on the monomers used in the polymerization, of an azo compound [azocompounds] which decomposes [decompose] into free radicals under the polymerization conditions.

7. (Amended) A process as claimed in claim 5, wherein the polymeric dispersant [dispersants] (B) used, is selected from the group consisting of polyethylene glycol, polypropylene glycol, copolymers of ethylene glycol and propylene glycol, polyvinyl acetate, polyvinyl alcohol, polyvinylpyridine, polyvinylimidazole, polyvinylsuccinimide, a 1:1 molar ratio copolymer of N-vinylcaprolactam and N-vinylmethylacetamide, polydiallyldimethylammonium chloride, polyethyleneimine and mixtures thereof.

8. (Amended) A process as claimed in claim 5 [any of claims 5 to 7] wherein

(A) N-vinylformamide, [if desired together] with or without other monoethylenically unsaturated monomers, and

(B) polyethylene glycol, polyvinylpyrrolidone or mixtures thereof are polymerized at from 40 to 55°C with a water-soluble azo initiator [initiators].

Please add the following claims:



9. (New) A process as claimed in claim 6, wherein

(A) N-vinylformamide, with or without other monoethylenically unsaturated monomers, and

(B) polyethylene glycol, polyvinylpyrrolidone or mixtures thereof are polymerized at from 40 to 55°C with a water-soluble azo initiator.

10. (New) A process as claimed in claim 7, wherein

(A) N-vinylformamide, with or without other monoethylenically unsaturated monomers, and

(B) polyethylene glycol, polyvinylpyrrolidone or mixtures thereof are polymerized at from 40 to 55°C with a water-soluble azo initiator.--